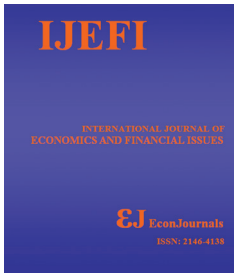

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An Improvement on An Interest Rate Commission Agent Banking System Model (AIRCABS Model)

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ABSTRACT

This paper sought to test An interest rate commission agent banking model's viability and reliability. An interest rate commission agent banking system (AIRCABS) increased the investor loan funding agent bank's profitability and sustainability by shifting credit risk and liquidity crunch to investors and entrepreneurs. The bank increases stable deposit by applying discrete market deposit interest rate incentive into depositors' accounts and by letting depositors latter to shift to investor position having the bank as an agent to collect proportionate credit price instead of deposit interest rate on the portion of the fund the bank has already invested. Therefore, an interest rate commission agent bank found viable and reliable.

Keywords: Agent Bank Model, Agent Bank's Profitability and Sustainability, Stable Deposit
JEL Classfications: E21, E22, E40, G01, G21, G32

1. INTRODUCTION

Traditional banking activities are declining and shifting into nontraditional banking activities because of the fact that banks suffered from toxic asset, contagion and the liquidity drought following the increase of bad debt. However, U.S.A banks which had a high income share from nontraditional activities such as investment banking and asset securitization were a base of U.S.A financial crisis in year 2007/2008 (De Young and Torna, 2013). The major reason of this fact is that banks were using customer deposit as their own asset on their balance sheet for their business trading activities. The financial crisis arose from U.S.A affected the living standard of under developing countries and led to higher levels of global poverty (Gallagher and Wilkins, 2012). Though banks preferred to shift into nontraditional banking activities such as investment banking, the financial crisis arose in U.S.A in year 2007/2008 had revealed the weakness of investment banking and other banks business models (Köhler, 2014; Lusignani and Onado, 2014). The reason behind the fast spread of financial crisis originated from U.S.A throughout the world was that the international financial governance structure lacks the appropriate tools and mechanisms to halt the situation (Marquez, 2010). Because banks had not adopted a business model by which they could transfer credit risk into individual investors, entrepreneurs and nonbanking institutions without holding customer deposit as their own asset, the models adopted by banks were a catalyst for financial crises.

Using the customer deposits as own asset on the banks' balance sheet exposed banks to credit risk and liquidity crunch, which is the sources of the financial crisis all the time. To protect the banking business from credit risk and liquidity crunch, banks had to shift their credit risk and liquidity risk to nonbanking institution or individual investors and entrepreneurs to avoid the same impact on the overall banking industry. This can be done by applying an interest rate commission agent banking system (AIRCABS), which is a system adopted by the bank to be an agent for investor loan funding (ILF) to entrepreneurs having the fund seller and buyer agreement to administer the loan after disbursement by collecting an agreed commission from ILF credit price. Loan transaction undergoes through AIRCABS liberalized between investors and entrepreneurs. Because of this fact, the agent bank exempted from paying the financial expense on the customer deposit. Since the agent bank has administered the loan after disbursement in an authentic manner, no moral hazard expected among investors, entrepreneurs and the agent bank. Services selling and fund

administration by an interest rate commission agent bank helped to mobilize stable deposit (SD) in the bank all the time.

The major challenging fact that changed SD into volatiles in traditional banks is the stiff competition among banks through service excellency. Since the traditional banks' profit source is the customer deposit, the increase of money withdrawals from customer deposit led to liquidity drain, which thereby increased the bank nonperforming asset, which is the result of defaulted loan by customers. The main contributors of the credit risk of the bank were borrowers' weak knowledge of loan administration, weak credit assessment of the bank, weak follow up of the bank, external factors such as unexpected burden of tax on the borrower's business and commodity price shock. However, AIRCABS shifted credit risk and liquidity crunch to investors and entrepreneurs and mobilized loan and deposit simultaneously.

However, AIRCABS administered the fund of investor based on the lending strategies, such as 360°, 180° and 90° lending strategies, that adopted by banks. Since the loan after disbursement followed the agent bank administration, the likelihood of the loan that did not get into nonperforming asset is high.

A business model adopted by banks that made them either retained risk or transferred risk to other financial institutions led latter to have same effect over the industry. Because of this fact, Financial crisis emanated from bank's credit risk and liquidity crunch resulted in bank failure has not yet been solved (Moise and Ilie, 2012; Adrian, 2015; Memmel et al., 2012). To solve these problems, An interest rate commission agent banking business model that transferred credit and liquidity crunch to individual by increasing the bank's sustainability, profitability and SD has empirically tested to explore the model viability and reliability.

The research under study aimed to answer the following research questions:

I. What is the effect of credit risk, such that bank's toxic or nonperforming or contagion asset and liquidity crunch on AIRCABS?
II. What is the effect of investor's loan funding on profitability and sustainability of an interest rate commission agent bank?
III. What is the effect of discrete market deposit interest rate incentive on bank's SD mobilization? In case of an interest rate commission agent bank worked together with conventional bank which latter shift to agent position when depositor need to be an investor.

The research study compared and contrasted with literatures in section 2. In section 3 the theory of the research study presented. In section 4 the methodology presented. In section 5 data analysis result presented. In section 6 discussions presented. In section 7 recommendations presented and in section 8 conclusions presented.

2. LITERATURE REVIEW

The bank faced a solvency problem as a result of holding toxic or impaired asset which was the source of financial crises. As the toxic asset of the bank increased the bank profitability decreased and distorted bank competition among financial institutions (Boudghene and Maes, 2012). AIRCABS enables banks to transfer credit risk to an investor and entrepreneur without considering the fund disbursed as asset to avoid the impact of bank toxic asset or impaired asset on the agent bank's profitability and sustainability in the market.

In order to refill the liquidity gap, banks lend fund to similar financial institution to develop interbank market without considering their counterparty losses and credit worthiness and exposed to toxic asset (Memmel et al., 2012). To avoid asset contagion in financial institutions, banks shall adopt AIRCABS in order to prone inter-bank loans market by mobilizing loan directly from the society by dealing investor's fund to entrepreneurs and administer the fund after disbursement on behalf of an investor to collect an agreed percentage of commission from ILF credit price.

The final stage of nonperforming asset is toxic asset or bad debt or contagion that affected the net interest rate margin of the bank (Lata, 2014). Since an interest rate commission agent bank did not hold disbursed fund as its own asset on its balance sheet, the agent bank transfer credit and liquidity risks to investors and entrepreneurs to avoid asset contagion or toxic asset problems.

Unlike the traditional banking model, banking model such as securitization and derivatives considered by banks as a basic tool to reduce capital requirement and improve revenue, but as a consequence they had negative repercussions on lending standards and quality of loans which indirectly led to weaken financial system (Bruno and Bedendo, 2013). Though credit enhancement has a positive effect in securitization, the risk associated with securitization and credit enhancement rise when the bank poorly performs securitization and became the sources of risk for securitizing bank (Mandel et al., 2012). The increment of asset quality deterioration made securitization to become a catalyst for financial crises as a result of which investor became more risk averse and reluctant to incur asset back securities. So securitization does not resist changeable market regulation (Kozak and Teplova, 2012). However, AIRCABS banks administers investor's loan funding to entrepreneur and the market regulation did affect the fund provider and entrepreneurs. Rather it gave an opportunity for investors and entrepreneurs to create their own loan market having the bank as an agent for fund provider in order to collect interest rate commission from ILF credit price.

Since banks bear business risk, they found expanding unsustainably as a result of a changed business model, which was developed to resist financial crises in several ways even though many of business models reversed in the post crisis scenario (Köhler, 2014). To properly implement an interest rate commission agent banking business model the agent bank has to equip with highly skilled personnel with perfect knowledge of the business model. The bank that applied this model enabled to administer investor's loan funding to entrepreneurs to mitigate its business risks and maximize its profitability to eradicate banking crises emanated from credit risk and liquidity crunch permanently.

Though conventional banks superior in profitability, liquidity and risk management over an Islamic banking, it is found suffering from credit and liquidity risk (Pillai and Siraj, 2012). So both an Islamic banking and conventional banking were not clear from credit and liquidity problems. During financial crises 2007-09, an Islamic bank properly operated than traditional bank (Rashwan, 2012). This indicated that the share of profit and loss in an Islamic banking system enabled it to resist banking crises somewhat in a better way than the conventional banking system. Rather applying AIRCABS enhanced the stability of the bank in the market by collecting uninterrupted profit without any financial cost and credit risk.

The major profit of a bank is sourced from interest income and the rest is from the service charge and commissioning. Though inflation negatively affected profitability, it is positively and significantly related with net interest margin (Doyran, 2012). The profitability of AIRCABS has positively affected by inflation and operating expense. So that, the interest rate movement in the market did not affect investor's loan funding credit price, which is fixed in loan contract, which in turn makes the agent bank's interest rate commission nonvolatile.

The loan pricing and financial intermediations are the true strong predictors of loan costs (Kamukama and Natamba, 2011). This indicated that loan cost determination depended on the past trend of loan, deposit price in the market and financial intermediation. However, loan cost determination by interest rate commission agent bank based on the trend of credit price and deposit interest rate in the market, loan administration cost of the bank and current regulation of the central bank. Though the loan interest rate finally approved by the agent bank, investor and entrepreneur presented their proposed consensuses on the loan interest rate which latter approved by agent bank after it has assessed its cost and benefit on the loan administration.

Banks which have lower levels of deposits, higher anticipated loan losses and high liquidity problems engaged in noninterest income generating activities to revive their losses and enhance their sustainability in a market (Damankah et al., 2014). Fee based income is riskier than margin income, but offer diversification benefits to bank shareholders and has got global importance since it reduce the risk associated with the impact of poor asset quality on the shareholder returns (William and Prather, 2010). Since an interest rate commission agent bank did not hold client's fund as own asset, the agent bank maximized interest rate commission income by transferring credit and liquidity risks to investors and entrepreneurs.

The bank's greater reliance on non-interest income particularly commission income associated with higher systematic risk (Jaffar et al., 2014). Because of the high competition among traditional banks, noninterest income of the bank was volatile that led to expose the bank to higher systematic risk. However, an interest rate commission based on the loan interest rate offered to entrepreneurs and did not volatile like the commissions collected by traditional bank' service selling. Because of this fact, an interest rate commission agent bank did not expose to systematic risk.

One of the factors that led the bank's balance sheet to grow is none performing loans or Contagions. The bank's balance sheet size growth bubbles the bank's systematic risk (Gan, 2014). AIRCABS did not hold the disbursed loan as an asset on the bank's balance sheet rather than trading off the loan disbursement from investor account to an entrepreneur by holding the loan amount in off balance sheet of the bank to maintain the bank's balance sheet size without growth. So that AIRCABS can keep safe the bank from credit risk, idiosyncratic risk, systematic risk, interest rate risk and liquidity risk.

The mobilization of deposit through interest rate incentive enables the bank to have a more stable fund which could be availed to loan and thereby increase its sustainability. Paying deposit interest incentive into a depositor's account enhanced the deposit mobilization, which in turn increased investment and economic growth of a country (Ngouhouo and Mouchili, 2014). AIRCABS, money depositors who had already sold their money for bank's investment purpose collected discrete market deposit interest incentive and latter have the opportunity of being an investor to collect proportionate credit price in terms of deposit interest rate from the fund already has invested by the bank which latter shifted into agent position to administer fund of the depositor. Coming up with interest rate strategies and products could attract both individual and firms from the informal sector to make savings within the formal sector (Chakazamba et al., 2013). The volume and mix of deposit can increase with the increase of interest rates incentive. As the bank created high gap between loan and deposit interest rate, the interest of the depositors to deposit stable fund at bank decreased (Mashamba et al., 2014). So applying discrete market deposit interest incentive into potential depositors' account helped banks to mobilize more savings from informal and formal sectors.

3. THEORY OF AIRCABS

3.1. AIRCABS Model

AIRCABS is a system adopted by bank to be an agent for investors' loan funding to entrepreneurs by including seller and buyer agreement that the loan would be administered after disbursement by retaining reasonable interest rate commission from the agreed investors loan funding credit price (Tessema and Kruger, 2015; 2016). Increasing the deposit interest rate increases deposit mobilization. Similarly, increasing the credit price increases the demand of investors to provide loan funding which in turn increases the bank's loan mobilization. Tessema and Kruger (2015) recommend that to adopt AIRCABS, banks should develop the following lending strategies:

1. 360° lending strategy: This strategy involves investor and entrepreneur known to each other and agent bank. Investor and entrepreneur go to agent bank at the same time. An investor can fund a loan to an entrepreneur by selecting an entrepreneur's project through an interest rate commission agent bank with or without pledging entrepreneur's collateral. Should an investor wish to collect the funds disbursed to entrepreneurs, the agent bank sells the loan to another investor who has an interest to invest in same entrepreneur's business. Similarly should the entrepreneur fail to pay as agreed, the

agent bank rents the business to another entrepreneur who has the capacity to manage the business and settle the loan without having ownership of the business. However, ownership can be transferred to the second entrepreneur by the will and approval of the investor and the bank. While the agent bank resale loan to the new entrant investor the reselling value of the loan should be reasonable according to the market but minimally equivalent to the remained debt amount with a onetime fee to cover administration expense. Therefore, the loan revolves from investor to entrepreneur and until it is settled, the bank collects an interest commission from the investor.

2. 180° lending strategy: This strategy involves an investor and an entrepreneur who do not know each other nor the bank. Investor and entrepreneur go to the agent bank at different times. With this lending strategy, an interest rate commission agent bank selects entrepreneur's project to finance through an investor. In selecting an entrepreneur's project, the bank charges an investor project selection fee. In this case, ILF requires pledging collateral to ensure that the bank collects the disbursed funds if the entrepreneur fails to repay the loan. All collateral and investment project should be registered at government organ in name of the agent bank to administer the loan up to settlement.
3. 90° lending strategy: This lending strategy involves the fund provider and the bank. With this lending strategy, the fund provider is money depositor who latter shifts all or part of the fund for investment to fund entrepreneur's project through an agent bank to collect the partial or full credit price. Otherwise, the investor sells the fund to the bank to collect a discrete market deposit interest incentive according to the deposit increment level.

The three lending strategies of AIRCABS enabled investors and entrepreneurs to transact loan without burden of central bank' policy restriction. Since investors and entrepreneurs were the principal promoter of AIRCABS, the opportunities of minimizing the gap between informal and formal sectors in the economy was high. AIRCABS stood on three pillars such as profitability, sustainability and risk transferring mechanism. Figure 1 depicted the AIRCABS model by which the loan process from investor to entrepreneurs explained and how AIRCABS maximized profitability, sustainability, operational efficiency, capital adequacy (CA) and liquidity by transferring credit risk and liquidity crunch to investors and entrepreneurs.

AIRCABS needs to be more efficient in technology, human capital, finance, and applying adequate technology and human capital helps to avoid exposure to operational risk.

The AIRCABS model depicted in Figure 1 detailed how an agent bank processes investors loan funding and administers the loan after disbursement to generate interest commission income and project selection fee as a return for loan administration and collection of disbursed fund on behalf of investors.

These lending strategies designed to shift credit risk and liquidity crunch to investors and entrepreneurs and thereby maximized the agent bank's profitability and sustainability in the market. Transferring credit risk to non-bank parties enables to establish a more stable financial sector than transferring credit risk within banking sector (Wagner and Marsh, 2006). When the ILF allocated to entrepreneur the agent bank (AIRCAB) did not hold the disbursed fund as an asset on its balance sheet and did not calculate deposit interest while fund of investor disbursed to an entrepreneur.

The agent bank collected interest rate commission by selling its services in handling investors' loan funding to entrepreneurs. Since the agent's interest commission based on the ILF credit price, the agent bank's income did not affect by volatility of the interest rate in the market. Once the agent bank established contractual agreement among investors, entrepreneurs and itself, the agent bank made investors and entrepreneurs to open account for loan transaction purpose to effect loan disbursement from investor's account into entrepreneur's account and collects the loan repayment from entrepreneur into investor account.

An interest rate commission agent banking business model can bring mutual benefit for investors, entrepreneurs, depositors and the agent bank. Since the model works with other banking business model according to the organization's incentive, structure, culture and skill of the employees, it protected the bank and fund provider from windfall and permanent banking risks for which other business models failed to resist. Since the agent bank collected interest rate commission up to loan settlement, its commission income uninterrupted without holding the depositors' fund as its own asset on its balance sheet to enhance the agent bank's sustainability in the market.

3.2. Accounting Entries Treatment of Interest Rate Commission Agent Banking System

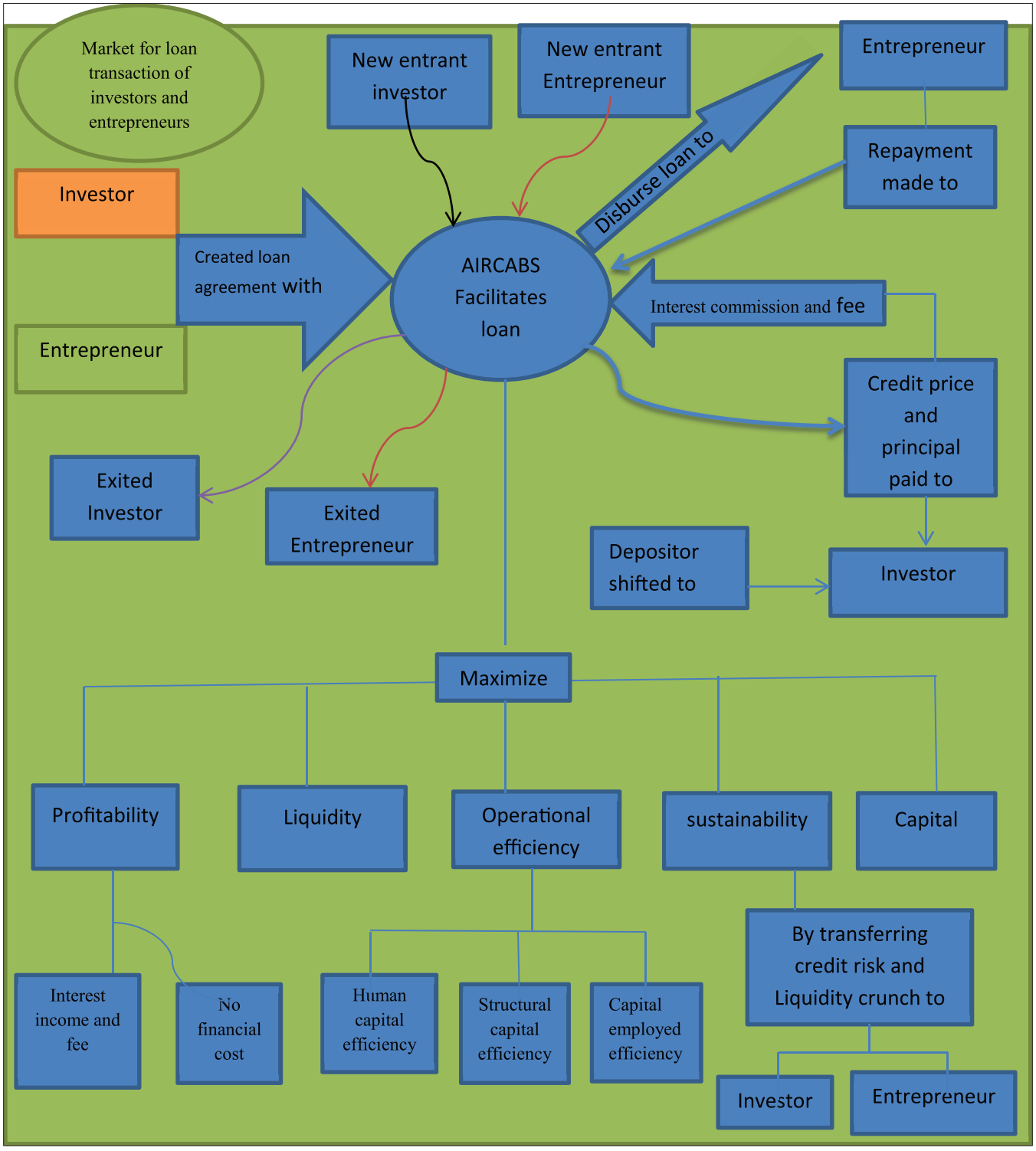
An interest rate commission agent bank used double accounting entries to effect loan disbursement from investor account into depositors account and to collect loan repayment from entrepreneurs' into investors' account. After contractual agreement has established among investor, entrepreneur and the agent bank, the agent bank made investor and entrepreneur opened account for the purpose of loan transaction. Since the agent bank did not hold investor deposit as its own asset on its balance sheet, the agent bank established off balance sheet loan transaction recording for loan management and follow up purpose.

The bank accounting entries while the transaction passed shall be as follows.

I. Once the bank became agent of ILF all loan transaction carried out through investor and entrepreneur account opened at the agent bank and the loan follow up and administration carries out through off balance sheet loan transaction recording ledger.
II. The entries at payable account of the bank while loan disbursement mad by agent bank shall be.
    a. On the liability side of the agent bank's balance sheet
    - Dr (Investor loan funding deposit account)
    - Cr (Entrepreneur account)

    b. Transaction recording on off balance sheet while loan disbursement effected
    - Dr (entrepreneur loan ledger)
    - Cr (payable investor loan ledger)

Figure 1: AIRCABS model



III. Transaction entries while loan repayment effected.

a. Loan transaction effect on balance sheet of the agent bank

- Dr (cash-total interest and principal payment of loan)
- Cr (partial interest rate income and principal payment into investor account)
- Cr (interest rate commission into bank income account)

b. Loan transaction effected on off balance sheet of the agent bank while repayment mad by entrepreneur

- Dr (payable investor loan ledger by total repayment)
- Cr (entrepreneur loan ledger-clear the principal by excess above the accrued interest balance)

4. MATERIALS AND METHODS

Primary and secondary data collection methodology adopted from Tessema and Kruger (2016). Primary data collected using survey questionnaires from 300 employees of commercial banks in Addis

Ababa, Ethiopia. The population of the research study was 1000. As a rule of thumb Cronbach's alpha ≥70% for Likert scales and ≥60% for binary scale, as is not uncommon in exploratory research, were acceptable for the degree to which the measurement instrument succeeds in describing research interest (Chronbach, 1951). Primary data collected based on the following measurement instruments.

Secondary data collected from commercial banks' audited financial statements and economic indicators from national banks of Ethiopia in the period covering from July 1, 1993 to June, 2016 based on financial ratios.

4.1. Method of Analysis

To answer the research questions the following research hypothesis tested.

H_0: Financial crisis emanates from credit risk and liquidity crunch have no positive effect on AIRCABS in administrating ILF to entrepreneur.

H_1: Investor's loan funding has a positive effect on profitability and sustainability of an interest rate commission agent bank.

H_2: Discrete market interest rate incentive has a positive effect on SD mobilization in case of an interest rate commission agent bank work together with conventional bank which latter shift to agent position when depositor need to be an investor.

To test the relationship between dependent and independent variables in H0, canonical correlation statistical tool applied. To test the interrelationship between dependent and independent variables in H_1 and H_2 multinomial logistic regression applied.

4.1.1. Canonical correlation analysis

Canonical correlation helps to reveal the strength of the two set of independent, credit risk and liquidity crunch, and dependent variable, AIRCABS.

The linear combination of credit risk and liquidity crunch variables (U) with a group of set of AIRCABS (W) variables constructed using the following equations:

Credit risk and liquidity crunch

$$(u_1)=a_{11}(\Delta D/TDB)+a_{12}(\Delta L/TL)_2+a_{13}(LA/TDB)_3+ a_{14}(NPLs/TL)+a_{15}(LLP/TL)_5+a_{16}(\Delta p/p)_6$$

Credit risk and liquidity crunch

$$(u_2)=a_{21}(\Delta D/TD)+a_{22}(\Delta L/TL+a)_{23}(LA/TD)+ a_{24}(NPLs/TL)+a_{25}(LLP/TL)+a_{26}(\Delta p/p)_6$$

.....:.....:.....:.....:.....:

Credit risk and liquidity crunch

$$(u_p)=a_{p1}(\Delta D/TD)+a_{p2}(\Delta L/TL)_2+a_{p3}(LA/TD)_3+ a_{p4}(NPLs/TL)+a_{p5}(LLP/TL)_5+a_{p6}(\Delta p/p)_6 \quad (1)$$

Where,

- Deposit run (ΔD/TD) - this ratio measure the deposit run on bank as percentage of change in deposit (CD) to total deposit. As the percentage of CD decline there is a run on bank by depositors.
- Credit crunch (ΔL/TL) - this ratio measure the decline of supply of loan at macro level as percentage of decline of change in loan and advance to total outstanding loan. The decline of loan and advance indicate the existence of liquidity crunch.
- Liquidity risk exposure (LA/TDB) - this ratio measure the liquidity risk of the bank as percentage of liquid asset to total sum of customer deposit and bank's short term borrowing. As the ratio decrease the bank is exposing to liquidity risk.
- Non-performing asset ratio (NPLS) - this ratio measures the level of non-performing asset to total loan portfolio. As the level of NPLs ratio increase beyond 5% of the total loan portfolio, which is in Ethiopian case, the bank exposed to credit risk.
- Credit risk (LLP/TL) - this is a measure of loan loss provision to total loan. As the ratio increases the bank is exposed to credit risk.
- Commodity price shock ratio $\left(\frac{\Delta p}{p_0}\right)$ - this is a measure change in the current price as percentage of the last price.

$$\text{AIRCABS } (W_2)=b_{11}(NIN)_1+b_{12}(EFR)_2+b_{13}(ROA)_3 +b_{14}(ROE)_4+b_{15}(CA)_5$$

$$\text{AIRCABS } (W_2)=b_{21}(NIN)_1+b_{22}(EFR)_2+b_{23}(ROA)_3 +b_{24}(ROE)_4+b_{25}(CA)_5$$

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$$\text{AIRCABS } (W_q)=b_{q1}(NIN)_1+b_{q2}(EFR)_2+b_{q3}(ROA)_3 +b_{q4}(ROE)_4+b_{q5}(CA)_5 \quad (2)$$

Where,

- Non-interest income growth rate (NIN) - this ratio measured the growth of non-interest income to total income.
- Bank's efficiency ratio **(**EFR**) -**the ratio measured total of non-interest income incomes as percentage of Non-interest expense.
- Return on asset (ROA) - this ratio measured the gross interest rate commission as percentage of total fixed asset. Since AIRCABS use fixed asset to generate interest rate commission by rendering its agency service to investor, the increase of the ratio indicates the increase of ROA.
- Return on equity (ROE) - the ratio measured net income excluding interest expense as percentage of equity of the bank.
- CA ratio - This ratio measures the bank's capital as percentage of administrative expense. Since AIRCABS transfers credit risk to investors and entrepreneurs, increasing in capital adequacy indicates the efficiency of the bank to enhance its stability and profitability.

The canonical correlation between two set of variables computed based on the level of significance, Magnitude of canonical root and redundancy index (Hair et al., 1998). However, the research study interest is to find the null hypothesis true using three criterions to identify no relationship between pairs of variates in canonical correlation.

To arrive at single redundancy index all redundancies across all root can be summed otherwise the first significant root can be considered as proposed by Stewart and Love, (1968).

However, the redundancy of coefficient that explained <10% of the remaining variance after that explained by a certain number of functions considered as significant non-correlation (Sherry and Henson, 2005).

The three methods of determining the relative importance of the canonical function of relationship are canonical weights, canonical loading and canonical cross loading.

Among all methods some authors considered canonical loading as alternate to cross-canonical loading to interpret the result (Thompson, 1991; Liu et al., 2009; Hair et al., 1998). However, this research study considered both canonical loading and cross-loading to interpret the result if the data became adequate and significant relationship existed between independents and dependents variables that let to proceed factor analysis.

Rotation in canonical correlation led to lose the optimal interpretation of the analysis. However, canonical functions, canonical loadings, and standardized canonical coefficients interpreted using Kaiser's (1974) normalized varimax rotation criterion.

Canonical function that explained <10% of the remaining variance after that explained by a certain number of functions, the effect size of other function are considered less impressive (Sherry and Henson, 2005).

In order to test level of canonical correlation significant between independent and dependent variates, wilks's lambda Chi-square applied. While testing the correlation to avoid type I error, the significance value to interpret the result set at a 95% confidence interval level. To interpret the magnitude or practical significance of the results, the value of squared canonical correlation that have the value 1.96% for small, 13.04% for medium and 25.92% for large and partial correlation have the value 14%,36% and 51% respectively considered (Cohen, 1992).

The data for canonical correlation analyzed using SPSS.

4.1.2. Multinomial logistic regressions analysis

To test and describe the relationship between predictor and predicted variables multinomial logistic regression statistical tool employed. Multinomial Logistic regression was developed in handling dichotomous outcomes as an advance technique of ordinary least squares (Pohlman and Leitner, 2003).

The research study sought to predict whether an agent bank in applying AIRCABS is profitable and sustainable or not in the market as a function of ILF and whether a bank mobilize SD or not as a function of discrete market deposit interest incentive.

Variables to predict the impact of ILF on the bank's profitability and sustainability, such that profitability and sustainability of AIRCABS in a market, are categorical variables for which data entered into analysis as dummy coding 1 as for existence of profitability and sustainability; 0 for nonexistence of profitability and sustainability. Similarly variables to investigates the effect of discrete market deposit interest incentive on the bank's SD mobilization, such that SD is categorical variable for which the data entered into analysis as dummy coding 1 for the existence of SD whereas 0 for nonexistence of SD. While using data in analysis, continuous value applied for continuous predictors of dependent variables. When the values of predicting independent variables' coefficient equal with zero in multinomial logistic regression model, the hypothesis under testing is said to be null hypothesis. This implied that there is no relationship between the predicting independent variable and the value of predicted dependent variable outcome. The multinomial logistic regression equation also didn't predict independent variable closer to the value of dependent variable. However, significance of the hypothesis implies that at least one of the coefficients' values of the predictors >0 and closer to the value of predicted dependent variable outcome.

To identify which of independent variables' indicators were predictor of dependent variable, profitability and sustainability of AIRCABS, in the market in the first research hypothesis (H_1) the following multinomial logistic regression equation developed.

$$Log\left[\frac{GPS(p=1)}{1-GPS(p=1)}\right] = a+b_1(ILF)+b_2(M2/GDP) +b_3(GNI/Popn)+b_4(TS/GDP)+b_5(GPDI/TBD) = b_6(NNI/NA) \quad (3)$$

Where,

- Gross profitability and sustainability (GPS) calculated based on Return on capital (ROC) which in turn calculated total profit as percentage of total capital and the result of which interpreted as > 0.
- $\left(\frac{\Delta ROC}{ROC}>0\right)$ for presence of GPS and ≤ 0 $\left(\frac{\Delta ROC}{ROC}\leq 0\right)$ for absence of GPS.
- ILF: Calculated total loan as percentage of total deposit.

Similarly, which of independent variables were best predictors of dependent variable, SD mobilization, in the second research hypothesis (H_2) the following multinomial logistic regression equation developed.

$$Log\left[\frac{SD(p=1)}{1-SD(p=1)}\right] = a+b_1(DMDI)+b_2(AVDR) +b_3(SPDR)+b_4(DIIR)+b_5(EDUR)+b_6(DIPC) \quad (4)$$

Where a is the y (GPS or SD) intercept and b is the slop parameter which lay between interval (0,1) SD calculated as the change in deposit (CD) less average deposit (AD) which can be interpreted as SD >0 (ΔCD−AD > 0) as a presence of SD and <0 (ΔCD−AD < 0) as absence of SD since the change should be greater than the AD.

- Discrete market deposit interest incentive (DMDI) calculated as change in ordinary saving deposit interest rate as a percentage of the period interest rate. Since the minimum deposit interest rate determined by national bank of Ethiopia the change in interest rate was not frequent.
- Financial deepening gross domestic product (M2/GDP) - this measured by Broad money (M2) ratio to GDP. It indicates the increased provision of financial service as a result of more liquid money available in the economy. The ratio indicates the development of financial service is the result of bank's sustainability and profitability in the market. The lower the ratio indicates the banking system access to limited fund and the cost of fund is high which led to have lower bank's profitability and sustainability in the market. The increment of the ratio indicated the increase in liquidity and thereby enhances banks' profitability and sustainability in the market.
- Per capita ratio GNI/popn - this measured by gross national income (GNI) per total population. The growth of the ratio indicates the growth of saving and investment which in turn led to growth in capital formation and re-investment. Per capita measure the income of each person in a country when resource divided by total population. As income of the population increases the capacity of the society to invest its cash using an agent bank increases.
- Total domestic saving ratio (TS/GDP)- this measured by total domestic saving to GDP ratio. it is a measure of excess of gross in domestic saving over consumption by government and private sector. As the ratio increases the country's capacity in domestic investment is high and thereby the bank's profitability and sustainability in a market is also high.
- Gross private domestic investment to total bank deposit ratio(GPDI/TBD)- this measured total gross domestic investment in domestic production using private business capital to total domestic saving raise bay bank. The investment can be using investor loan fund through AIRCABS. As the ratio increases the private investment increased and thereby increased the AIRCABS profitability.
- Management efficiency ratio (NIE/NNI)-this measured total noninterest expense as percentage of total non-interest income. The ratio indicates how much money the bank invests to produce 1 dollar profit. As the ratio decreases the bank efficiency increases whereas the increment of the ratio indicates that the bank incurred loss to get 1 dollar profit.
- Deposit rate (AVDR) –this ratio measure commercial bank AD interest rate. As the deposit rate increases the bank deposit mobilization increased.
- Special deposit ratio (SPDR)-this ratio measured money deposited at bank for specific purpose of the customer benefit and will not be withdrawn at any time by customer as ratio of total deposit. As the ratio increased the bank's SD increased.
- Deposit interest incentive rate (DIIR) - this measured the change in growth of deposit interest rate as percentage of total deposit interest rate. The ratio measures how much incentive interest rate raised the level of deposit and the increase of the ratio indicates the growth level of SD at bank.
- Efficiency of deposit utilization ratio (EDUR) - this measured total interest expense as percentage of total loan interest rate. Interest expense directly related with availability of sufficient liquidity and the increase of loan cost implies the bank limitation to access fund in a market. The ratio developed to indicate revenue generated by deposit in loan advanced. As the ratio increases the bank SD increased.
- Deposit interest incentive payment capacity ratio (DPIC)-the ratio measure deposit interest expense as percentage of total capital.

To assess the fit of the model against data collected to test the hypotheses, four inferential tests, such as brown Chi-square, the Pearson Chi-square, deviance-based and descriptive measures were adopted (Brown, 1982; Prentice, 1976; Hosmer and Lemeshow, 2000).

4.1.3. Mixing individuals survey respondents' perception with quantitative data analysis result

Integrating the quantitative result of the study with individual survey respondents' perception helped to explore the best method in strengthen problem centered finding of the research study by overcoming the weakness of qualitative/quantitative method with strength of Qualitative/quantitative method (Creswell, 2003; Castro et al., 2010).

Coefficient of variation (CV), which calculated as standard deviation as proportion of mean or standard error estimate as proportion to the estimate itself, applied to measure the precision of individual survey respondents to the point of survey instruments. Though CV didn't measure bias due to nonresponse bias it measures the precision of estimated mean and can be applied estimator of population parameter (Schouten et al., 2013). It is used to compare sample of data from same variables when mean measures were very different (Lovie, 2005). It is a measure of relative variability of positive random variable distribution whose standard deviation less than the mean to show the reliability of the respondents' perception to the point of survey instruments (Pryseley et al., 2010). The higher the CV meant the deviation from central mean was high (Curto and Pinto, 2009). Though the CV measure widely applied in field of science, it has not widely applied in social science (Kelley, 2007). Because of this fact the threshold of the CV had not fixed at some referral point to interpret individuals' point of agreement with survey instruments. To analysis the survey respondents' agreement or disagreement of the research study, the CV reference point set based on the significant level of parameter estimated using quantitative data. Accordingly the maximum level of likert scale survey questionnaire that set as below or equal to 0.30 considered as acceptable rates while CV above 0.30 considered to be explain in caution referring to the mean. On the other hand for binary survey questionnaires response of the research study CV that set as below or equal to 0.50 considered as acceptable rate while ratio above 0.50 to be explained in caution referring to the mean of the survey instruments.

5. STATISTICAL RESULT AND ANALYSIS

To reveal the relationship between independent and dependent variables of the null hypothesis (H_0) canonical correlation applied. To answer the alternative hypothesis (H_1 and H_2) multinomial logistic regression applied. Inter-correlation of Likert and binary

scale items in survey instruments measured by cronbach alpha and kuder-richardson (KR20) statistical tools respectively. The reliability and validity of survey instruments were tested using factor analysis, mean, standard deviation and CV.

The following section detailed how validity and reliability constructed to measure the perception individuals survey participants. To identify the strong relationship between the independent and dependent variables canonical correlation statistical result discussed in section 5.2 followed by multinomial logistic results for profitability and sustainability and SD mobilization discussed in section 5.3.

5.1. Validity and Reliability of Survey Instruments

5.1.1. Statistical result of individual perception respond on credit risk and liquidity crunch survey instruments

Cronbanch alpha value for Likert scales survey instruments developed for credit risk and liquidity crunch on one hand and interest rate commission agent banking system (AIRCABS) on the other hand calculated as 0.820 and 0.789 respectively. Cronbanch alpha value >0.70 acceptable to show how strong relationship established among items of survey instruments of credit risk and liquidity crunch and survey instruments of AIRCABS.

Based on the survey questionnaires depicted in Tables 1 and 2, the participant got a higher mean score on credit risk and liquidity crunch's survey questionnaires with less variability relative to the mean. So that, individuals participant's perception on credit risk and liquidity crunch survey instrument strongly agreed with the point of questions, Q1, Q2, Q4, Q5, Q6, Q7, Q8, Q10, Q11, Q12, Q13 and Q15, because the individuals participant's perception was very close to the central mean. Whereas, individuals perception's a little bit found far from central tendency on Q3, Q9, Q14 and Q16.

Similarly, the participant got higher mean scores on AIRCABS survey questionnaires with less variability relative to mean even though individuals participant's perception on AIRCABS survey instrument strongly agreed with the point of questions Q2, Q3, Q4, Q5, Q6, Q7 and Q8 because individuals respondent perception was very close to central mean. Whereas, individuals perception's found a little bit far

Table 1: Indicators of credit risk and liquidity crunch and AICABS

Indicators of credit risk and liquidity crunch which measured by strongly agree=5, agree=4, natural=3, disagree=2, strongly disagree=1	Indicators of AIRCABS which measured by strongly agree=5, agree=4, natural=3, disagree=2, strongly disagree=1
Q1. Decrement of bank's loan growth and capital is sign of liquidity crunch	Q1. The bank's buying and selling of fund deprived the depositor's to get credit price
Q2. Bank lending practices that lead borrower more vulnerable to abusive practice enhances liquidity crunch	Q2. As deposit and credit interest rate approach equilibrium point the bank shall work as an interest rate commission agent for investor loan funding to entrepreneur to enhance its sustainability in market
Q3. The bank that involved in high level of interest income exposed to liquidity crunch	Q3. Providing alternative investment opportunity to fund provider by AIRCABS enable to enhance stable fund in the bank.
Q4. The misjudgment of bank strategic increases the bank liquidity risk	Q4. Providing high deposit interest rate and credit price by AIRCABS enable the bank to attract funds from the unbanked and banked society
Q5. Bank failures sourced from effect of deposit run	Q5. Administering investor loan funding through AIRCABS enable to eradicate liquidity crunch
Q6. High illiquid asset that is unaccepted for common valuation in market is the source liquidity risk	Q6. Bank can transfer credit risk using AIRCABS to the fund holder and investor to increase its profitability and sustainability
Q7. Instability of depositors led the bank to liquidity risk	Q7. AIRCABS enables the fund owner to search potential borrowers with or without collateral in the market to provide a credit facility using the bank as an agent
Q8. Diversifying loan funded by bank out of intended purpose led the borrower to defaulter	Q8. The right of the investor and depositors to get their fund return will be safely kept by the bank using AIRCABS
Q9. Funding loan by bank to entrepreneur as own asset increases the bank's credit risk	Q9. Under AIRCABS the bank's profit will be simply maximized without financial expense
Q10. Credit operation weakness of borrower leads the loan to default	
Q11. Loan sanctioned by corruption lead borrower to default	
Q12. Lack of good credit assessment and follow up by bank lead to increase nonperforming asset	
Q13. Borrowers default for lack of management support from lending organ	
Q14. Buying and selling of money exposed the bank to credit risk	
Q15. Decline of commodity prices for exporters, who used bank loan facility, can result higher nonperforming loans (NPLs)	
Q16. As capital adequacy increases credit risk of the bank decreases	

Source: Tessema and Kruger (2016). CA: Capital adequacy, NPLS: Nonperforming loans

from central tendency on questions, Q1 and Q9. This indicated that as coefficient variation getting lower than 0.30 the participants agreed with the research interest which in turn implied that the majority of the respondents agreed with points of items in the survey instruments.

The KMO >0.60 represented the ratio of the squared correlation between variables to the squared partial correlation between variables (Field, 2009. p. 647). KMO test result for measuring instruments of credit risk and liquidity crunch on one hand and AIRCABS on other hand were 0.885 and 0.828 respectively. These results implied that the partial correlation among measurement instruments were high and the participants' responses in the sample was adequate. The Bartlett's test of sphericity Chi-square for credit risk and liquidity crunch and AIRCABS were 1068.78 and 635.784 respectively. KMO and Bartlett's Test of credit risk and liquidity crunch and AIRCABS were significant at P = 0.000 and P = 0.000 respectively, which were below the standard significant level (P < 0.05). This implied that the correlation matrix was not an identity matrix that a matrix of all diagonal elements are neither one nor all off diagonal elements closed to zero. So that, the measurement instrument used in data analysis had a strong relationship.

Though KMO and Bartlett's test result allowed to proceed further factor analysis to construct validity of survey instruments.

5.1.1.1. Factor analysis for validity of credit risk and liquidity crunch and AIRCABS survey questionnaires

Tables 3 and 4 depicted the first few extracted factors whose eigenvalue >1 explained the majority of variables' variance. In analyzing variance of survey instruments, the dimension of credit risk and liquidity crunch survey instruments reduced and 5 factors retained from the total of 16, in Table 3, and the dimension of AIRCABS survey questionnaires were reduced and 3 factors retained from the total of 9 factors, in Table 4. Accordingly, factors of credit risk and liquidity crunch and AIRCABS whose eigenvalue >1 accounted for 84.26% and 76.175% of the total variances respectively which in turn implied that the factors were reliable and highly defined.

So using varimax (ortogonal) rotation five factors extracted for credit risk and liquidity crunches while 3 factors extracted for AIRCABS survey questionares and factor loading >0.50 which approached to one for each survey instruments obtained. As the

Table 2: Indicators of investor loan funding and stable deposit

Indicators of investor loan funding which measured by strongly agree=1 strongly disagree=0 stated as follow	Indicators of discrete market deposit interest incentive which measured by strongly agree=1 strongly disagree=0 stated as follow
Q1. Investor loan funding increase the agent bank's profitability in broad sample base	Q1. The increase of deposit interest rate increases the demand of depositor
Q2. Investor's loan funding enhances the bank liquidity and efficiency	Q2. Applying discrete market interest rate incentive for those deposit's volume increases the demand of depositor to keep their deposit stable increases
Q3. investor loan funding can enhance the bank's loan administrative efficiency and capacity	Q3. Applying various level deposit interest rate incentive for depositors enable the bank to get more SD
Q4. Funding loan by investor to entrepreneur through an interest rate commission agent bank eliminates the bank exposure to credit risk and liquidity crunch	Q4. Allowing depositor to participate in bank's investment by paying proportionate credit price for their partial or full fund enable the bank to have more stable fund
Q5. As the supply of loan funding by investor to entrepreneur's increases through an interest rate commission agent bank investment in a country enhances and thereby increases the country GDP	Q5. Interest incentive on deposit in terms of incentive in kind enables the bank to hold more clientele
Q6. Benefiting credit price to investor loan funding enhances the agent bank interest rate commission	

SD: Stable deposit

Table 3: Total variance explained for credit risk and liquidity crunch

Component	Initial eigenvalues			Rotation sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	5.214	32.588	32.588	3.524	22.022	22.022
2	2.851	17.818	50.406	3.053	19.083	41.105
3	2.456	15.351	65.757	3.037	18.982	60.088
4	1.869	11.684	77.440	2.429	15.180	75.268
5	1.090	6.815	84.255	1.438	8.987	84.255
6	0.810	5.062	89.317			
7	0.549	3.434	92.751			
8	0.429	2.684	95.436			
9	0.273	1.706	97.141			
10	0.180	1.124	98.265			
11	0.174	1.085	99.350			
12	0.051	0.320	99.671			
13	0.038	0.240	99.911			
14	0.014	0.089	100.000			
15	5.288E-16	3.305E-15	100.000			
16	2.626E-17	1.642E-16	100.000			

Extraction method: Principal component analysis

value of factor loading approached to 1, the variables correlation with that factor increased. So the extracted five focators for credit risk and liquidity crunch on the one hand and 3 factors for AIRCABS were found uni-dimensional and facorially distinct. All items used to operationalize a particular construct were loaded onto a single factor. So each survey questionaire of credit risk and liquidity crunch and AIRCABS have srong correlation with selected component's loadings.

5.1.2. ILF and discrete market deposit interest rate survey questionnaires statistical results and interpretation

The Cronbach alpha statistical tool that applied to measure internal consistency of scale respond items failed to measure internal consistency of items with binary respond and instead of it Kuder –Richardson statistical tool applied. The alpha value for ILF was 0.616 and the alpha value for discrete market deposit interest incentive was 0.701. Though the minimum requirement alpha value for likert scale items was 0.70 and more, the alpha value 0.60 and more was not uncommon in exploratory research. Salvucci et al. (1997) calculated rang of reliability measures of alpha value between 0.50 and 0.80 as moderate and alpha value above 0.80 stated as highly reliable. So the alpha value of Kuder-Richardson test result obtained allowed to proceed factor analysis to construct validity of survey questionnaires.

5.1.2.1. Factor analysis for validity of ILF and discrete market deposit interest incentive survey questionnaires

Item in the survey questionnaire for ILF and discrete market deposit interest rate incentive further analyzed using factor analysis to reveal the validity of survey instrument. The ILF's cronbanch alpha values of dimension 1 as 0.986 and dimension 2 as 0.966. The total variance accounted for dimension 1 was 68.949% and dimension 2 was 31.051%. The higher eigenvalue that helped to determine the percentage of variance accounted for 68.949% in the optimally binary response items considered over the smaller one, dimension 2. Similarly, cronbach alpha value for discrete market deposit interest rate incentive in dimension 1 was 0.997 and in dimension 2 was 0.996. The total variance accounted for dimension 1 was 56.50%. Whereas, for dimension 2 accounted for 43.50%. The higher eigenvalue, dimension 1, whose variance accounted for 56.50% considered over dimension 2.

Once significant cronbach alpha value and percentage of variance identified the survey questionnaires whose variation displayed less 10% excluded from analysis. Tables 5 and 6 displayed the coordination of each survey questionnaire in relation to the centroid (0, 0) when all survey questionnaires items represented by a straight line between dimentsion1 and dimension 2.

Table 4: Total variance explained for AIRCABS

Component	Initial eigenvalues			Rotation sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	3.666	40.731	40.731	2.913	32.365	32.365
2	1.903	21.146	61.877	2.063	22.925	55.290
3	1.287	14.298	76.175	1.880	20.885	76.175
4	0.724	8.047	84.222			
5	0.684	7.597	91.819			
6	0.326	3.617	95.437			
7	0.256	2.841	98.278			
8	0.120	1.330	99.608			
9	0.035	0.392	100.000			

Extraction method: Principal component analysis

Table 5: Variance accounted for

Investor loan funding survey questionnaires	Centroid coordinates			Total (vector coordinates)		
	Dimension		Mean	Dimension		Total
	1	2		1	2	
As the supply of loan funding by investor to entrepreneur's increases through an interest rate commission agent bank investment in a country enhances and thereby increases the country GDP (Q5)	0.994	0.149	0.571	0.993	0.007	1
Funding loan by investor to entrepreneur through an interest rate commission agent bank eliminates the bank exposure to credit risk and liquidity crunch (Q4)	0.993	0.131	0.562	0.993	0.007	1
Investor Loan funding increase the agent bank's profitability in broad sample base (Q1)	0.993	0.026	0.509	0.993	0.007	1
Benefiting credit price to investor loan funding enhances the agent bank interest rate commission (Q6)	0.992	0.008	0.500	0.992	0.008	1
Investor's loan funding enhances the bank liquidity and efficiency (Q2)	0.993	0.043	0.518	0.992	0.008	1
Investor loan funding can enhance the bank's loan administrative efficiency and capacity (Q3)	1.000	1.000	1.000	0.755	0.245	1
Active total	5.965	1.356	3.661	5.717	0.283	6
% of variance	99.416	22.606	61.011	95.290	4.710	100

All survey instruments whose mean value >10% have substantial contribution to the principal components displayed in Tables 5 and 6. So that all ILF and discrete market deposit interest incentive items in survey instruments strongly contributed to the principal components that made them considered in the analysis. ILF and discrete market deposit interest incentive items in survey questionnaires have high inter-correlation with factor one and less loaded to second factor respectively. All factor loading found >0.50 and the measurement instrument of ILF and discrete deposit interest rate incentive found reliable and valid. This implied that the survey instruments developed were correct for data collection and for analysis of individual perception.

5.2. Canonical Correlation Statistical Result

The relationship between credit risk and liquidity crunch on the one hand and AIRCABS on the other hand identified using canonical correlation to answer the research question of the following hypothesis.

H_0: Credit risk and liquidity crunch have no positive effect on AIRCABS in administrating investors loan funding to entrepreneurs.

To investigate the impact of credit risk and liquidity crunch on AIRCABS the following mean and standard deviation developed to ascertain the variables' deviation from the central tendency.

As have disclosed in Table 7 the relationship between independent variables, credit risk and liquidity crunch, and dependent variables, AIRCABS, described by simple statistical mean and standard deviation.

A very high deviation of variables from central tendency has made a great diversity of variables uncorrelated. Since the standard deviation of liquidity risk, nonperforming loan, credit risk, bank efficiency and CA were greater than their mean value, there was seen high variability of variables from central tendency except ROA variables.

Canonical correlation interpreted by the level of significant, the size of canonical correlation and the magnitude of redundancy index. To investigate further the relationship between independent variables, credit risk and liquidity crunch, and dependent variable, AIRCABS, simple statistical correlation conducted.

5.3. Level of Significance of Canonical Correlation

As have indicated in Table 8 the t-value followed by t-distribution to test the null hypothesis that canonical coefficient of independent and dependent variables were zero. Since the probability of t statistics was greater than the alpha level (0.05), the canonical correlation coefficient between independent and dependent variables found zero, which in turn implied that there was no established linear relationship between independent variables, credit risk and liquidity crunch, and dependent variables, AIRCABS.

Accordingly items neither on independent side nor on dependent sides created correlation with one another. So the null hypothesis that there was no relationship between credit risk and liquidity crunch on the one hand and AIRCABS on the other hand accepted. So as to not arrive at conclusion by only statistical t-test, additional test in investigating the relationship between independent and dependent variables conducted.

Table 6: Variance accounted for

Discrete market deposit interest incentive	Centroid coordinates			Total (vector coordinates)		
	Dimension		Mean	Dimension		Total
	1	2		1	2	
Allowing depositor to participate in bank's investment by paying proportionate credit price for their partial or full fund enable the bank to have more stable fund. (Q4)	0.999	0.281	0.640	0.998	0.002	1.000
Applying various level deposit interest rate incentive for depositors enable the bank to get more stable deposit (Q3)	0.998	0.085	0.541	0.998	0.002	1.000
Interest incentive on deposit in terms of incentive in kind enables the bank to hold more clientele. (Q5)	0.998	0.085	0.542	0.998	0.002	1.000
The increase of deposit interest rate increases the demand of depositor. (Q1)	0.998	0.021	0.509	0.998	0.002	1.000
Applying discrete market interest rate incentive for those deposit's volume increases the demand of depositor to keep their deposit stable increases (Q2)	1.000	1.000	1.000	0.970	0.030	1.000
Active total	4.993	1.472	3.233	4.962	0.038	5.000
% of variance	99.867	29.442	64.655	99.244	0.756	100.000

Table 7: Descriptive statistics for credit risk and liquidity crunch and AIRCABS

Measures	Deposit run	Credit crunch	Liquidity risk	Non-performing loan	Credit risk	Non-interest income	Bank efficiency	ROA	ROE	CA
Mean	0.16	0.15	0.54	0.0288	−4.045	0.0739	2.13	3.85	0.56	10.83
Standard deviation	0.1001	0.1	0.62	0.0565	17.99	0.069	1.02	0.66	0.24	28.51
Coefficient of variation	0.63	0.67	1.15	1.96	−4.45	0.93	0.48	0.17	0.43	2.63

ROA: Return on asset, ROE: Return on equity, CA: Capital adequacy

Table 8: Linear combination for canonical correlation

Covariate	Deposit run	Credit crunch	Liquidity risk	Non-performing asset	Credit risk	Commodity price shock
Non-interest income	−0.287	0.718	−0.264	−0.0685	−1.85	−0.283
	0.778*	0.484*	0.796*	0.946*	0.085*	0.781*
Bank efficiency	−0.354	−0.224	1.332	−0.965	−1.628	−0.247
	0.728*	0.826*	0.204*	0.351*	−0.126*	0.808*
ROA	0.536	0.9507	−0.878	−0.361	−0.503	−0.908
	0.6*	0.358*	0.395*	0.723*	0.623*	0.379*
ROE	−1.059	0.935	−0.653	0.265	0.939	0.226
	0.307*	0.366*	0.524*	0.795*	0.363*	0.824*
CA	0.613	0.758	−0.487	−0.214	−0.575	−0.023
	0.55*	0.461*	−0.634*	0.834*	0.575*	0.982*

*Ratio of t-value with non-significant P>I t I. ROA: Return on asset. ROE: Return on equity, CA: Capital adequacy

The result indicated by the Table 9 is a separate test of each canonical function that all canonical roots evaluated as non-significant and the model didn't fit the data according to multivariate criterion report of pillais, hotellings, Wilks and Roy.

In Table 9 multivariate statistical test showed the model is not generally a fit model and extracted five canonical roots did not significantly correlate and dependent to one another as depicted in the following Table 10.

The results indicated in Tables 7-10 implied that test of canonical correlation between independent, credit risk and liquidity crunch, and the dependent variables, AIRCABS, found insignificant relationship and the null hypothesis of the research study accepted.

5.3.1. The magnitude of canonical correlation

The significant level of canonical function is based on the size of canonical correlation. Though no accepted rules established either to accept or reject the size of canonical correlation, the research study based on the significant level of multivariate test and factor analysis.

To run factor analysis the sampling adequacy and model fit test conducted using Kaiser-Meyer-olkin and Bartlett's test and no canonical correlation between independent variables, credit risk and liquidity crunch, and dependent variables, AIRCABS, found to proceed further factor analysis on size of canonical correlation as depicted in Table 11.

As indicated in Table 11 the sampling adequacy is below the minimum requirement 0.60 and model fit test of barteltt's test of Chi-square found insignificant at P = 0.868, which was above the required significant level (P > 0.05). The data was not suit to proceed factor analysis because there was no relationship between independent variables, credit risk and liquidity crunch, and dependent variables, AIRCABS.

5.3.2. Redundancy measure of share variances

As indicated in the Table 12, the share variance account for 65.83% of total shared variances between the canonical variates. However, squared canonical correlation did not represent the variance extracted from the sets of variables except the variance shared by the linear composites of the sets of dependent and independent variables (Alpert et al., 1972).

Table 9: Multivariate tests of significance

Test name	Value	Approximate F	Significant of F
Pillais	1.24510	65.00	0.839*
Hotellings	2.66393	37.00	0.880*
Wilks	0.17734	38.00	0.856*
Roys	0.65825		

* Non-significant P>0.05

Table 10: Dimension reduction analysis

Canonical function	Wilks L.	F	Significant of F
1 TO 5	0.17734	0.68525	0.856*
2 TO 5	0.51892	0.37308	0.989*
3 TO 5	0.69149	0.36651	0.965*
4 TO 5	87344	0.27999	0.941*
5 TO 5	0.97734	0.15070	0.862*

*Non-significant P>0.0

Table 11: KMO and Bartlett's test

Kaiser-Meyer-Olkin measure of sampling adequacy	0.320
Bartlett's test of sphericity	
Approximate Chi-square	34.657
Df	45
Significant	0.868

As the matter of this fact instead of squared canonical correlation, redundancy index calculated to use as a measure of shared variance as proposed by Lambert and Durand (1975).

The redundancy index which measure the amount of share variance in the dependent variables explained by independent canonical variate is <10% of variance in their function except for the first canonical function which had less impressive to interpret the corresponding canonical function since the overall model was insignificant.

The proportion of variance shared between the variable sets across all functions calculated as 82.27% for full model as indicated which is higher than the first squared canonical correlation, 65.83% (= 0.81132^2), even though the sum of squared canonical correlation effect size always greater than the full model effect (Sherry and Henson, 2005). This implied that the second function has not created after the first has explained by as much variability as observed variables. This indicates that no relationship found between variate of credit risk and liquidity crunch on the one hand and variate of AIRCABS on the other hand.

Because of insignificant canonical correlation between independent and dependent variables the model didn't fit the data and further interpretation of canonical root and redundancy index was not considered to reveal the significant size of original variables in canonical correlation using factor analysis.

As the result of statistical test, the null hypothesis of the research study accepted that credit risk and liquidity crunch have no impact on AIRCABS.

5.3.3. Individual perception on credit risk and liquidity crunch survey questionnaires

Based on survey questionnaires in Table 1, the dispersion of variables of credit risk and liquidity crunch (CRLC), and AIRCABS relative to the mean showed was high variability. All survey participants' perception whose CV ≤0.30 strongly agreed with point of questions except survey questionnaires CRLC-Q3 (CV 0.34), CRLC-Q9 (CV 0.33), CRLC-Q14 (CV 0.33), CRLC-Q16 (CV 0.33), AIRCABS-Q1 (CV 0.34) and AIRCABS-Q9 (CV 0.36) whose survey participants' perception a little bit far from central tendency.

In nutshell, 67% of respondents of survey questionnaires on credit risk and liquidity crunch agreed with the research interest whereas 15% of respondent disagree with the research interest even though 18% of respondent were indifferent either to agree or disagree with the research interest. On the other hand 63% of respondents' perception on AIRCABS survey questionnaires agreed with the research interest whereas 22% were indifferent either to agree or disagree even though 14% of individual perception showed disagreement on the point of questions. The CV of each respondent showed near to zero which in turn indicated the majority of respondent agreed with the research interest.

The CV calculated for the all survey questionnaires were very close to zero as the individual survey participants' perception very close to the central mean. Since all survey instruments assessed by the individual survey participants enhanced the contents of independent and dependent variables that applied in quantitative analysis, the individual participants' agreements with the point of questions enable to ascertain again the result that credit risk and liquidity crunch had no positive impact on AIRCABS. The mix of individual survey participants' perception and quantitative analysis of financial statement showed credit risk and liquidity crunch have no impact on AIRCABS.

Therefore, the null hypothesis that credit risk and liquidity crunches have no positive impact AIRCABS accepted.

5.4. Statistical Result of ILF and Discrete Market Deposit Interest Rate Incentive

ILF prediction of sustainability and profitability of AIRCABS and discrete market deposit interest incentive prediction of SD mobilization analyzed based of audited financial statement of commercial banks in Ethiopia to answer the question of the following research hypothesis.

H_1: Investors' loan funding has a positive effect on profitability and sustainability of an interest rate commission agent bank.

H_2: Discrete market interest rate incentive has a positive effect on SD mobilization in case of an interest rate commission agent bank finance an entrepreneur which latter shift to agent position when depositor need to be an investor.

5.4.1. Model fitting information

The model fitting information detailed the dependent and independent variable together with its control variable to assess the final model. To identify the relationship between sustainability and profitability of AIRCABS with ILF identifying the risk related within the predictor and predicted variables is vital (Bayaga, 2010). Analyzing the risk between independent and dependent variables using multinomial logistic regression helped to identify the overall relationship.

Tables 13 and 14 detailed the model fitting information of sustainability and profitability of AIRCABS which predicted by ILF together with its control variables, such as bank efficiency, ROA, ROE and CA on one hand and on other hand SD predicted by discrete market deposit interest incentive together with Special deposit ratio, AD interest rate, Deposit interest incentive rate, EDUR, deposit interest payment capacity. The Chi-square (8.912) in Table 13 and Chi-square (17.323) in Table 14 which are the difference between −2 log-liklihoods of the null model and the

Table 12: Redundancy index and effect of shared variance

Root No.	Canonical correlation	Square correlation (Rc2)	Effect size index (1-Wilks λ)	Redundancy index*
1	0.81132	0.65825	0.82266	0.1639
2	0.49957	0.24957	0.48108	0.0621
3	0.45641	0.20831	0.30851	0.0519
4	0.32605	0.10631	0.32655	0.0265
5	0.15053	0.02266	0.02266	0.0056
Amount of shared variance (SV), *(SV)(Rc2)				24.902%

Table 13: Model fitting information of profitability and sustainability of AIRCABS

Model	Model fitting Criteria			Likelihood ratio tests		
	AIC	BIC	−2 log likelihood	Chi-square	Df	Significant
Intercept only	23.930	24.703	21.930			
Final	17.018	18.563	13.018	8.912	1	0.003

final model found significant at P = 0.003 and P = 0.000, which are less than cut-off P = 0.05, which accounted for the model fitted the data better and accurately than a null model. The value of AIC and BIC, which are information theory based on the significant of model fitting the data were very close to −2 log Likelihood both in Tables 13 and 14. The closeness in distance among AIC, BIC and −2 log Likelihood implied that the likelihood of the models to the true expected value. So the null hypothesis that can be stated as no difference between the model without independent variables and the model with independent variables was rejected and alternative hypothesis (H_1 and H_2) of the research study accepted.

5.4.2 Goodness-of-fit

Table 15 reported further evidence of statistical insignificant level of Pearson and deviance goodness-of-fit for model. The Pearson and deviance for sustainability and profitability of AIRCABS (0.376 and 0.525) and SD (0.899 and 0.966) were the difference between the current model and the full model whose null value were P > 0.05 that made the model a good overall fit to the data and predicted probabilities that did not deviate from the observed probabilities to the extent that binomial distribution did predict.

5.4.3. Pseudo R^2

Table 16 reported Pseudo R^2 results of the Cox and Snell, Nagelkerke and McFadden measures of effect size, which are commonly used in multiple regressions, approximately computed for multinomial logistic regression. So the higher pseudo R^2 that approached to 1 considered a better fit. In this case Table 16 reported Negelkerke (0.572) higher value than Cox and Snell (0.427) and McFadden (0.406) for profitability and sustainability of AIRCABS. Similarly in Table 16 Negelkerke (0.780) higher value than McFadden (0.648) and Cox and Snell (0.562) for SD. The highest value of Pseudo R^2 that showed by Negelkerke in both Table 16 indicated the relationship between the predictor and predicted variables were strong. In Table 16, 40.6% up to 57.2% and 58.2% up to 78% of the variability were explained by independent and dependent variables used in the model respectively.

5.4.4. Likelihood ratio tests

The likelihood ratio Tests in the Tables 17 and 18 depicted components of independent variables that compared to the full model and each predicting independent variables meaningfully contributed to the full effect. The Chi-square (8.912) in Table 17 and Chi-square (17.323) in Table 18 were significant at P = 0.003 and P = 0.000 respectively, which are less than the cut off P < 0.05. This indicated that the independent variables, such as ILF, Financial deepening, Per capita income, Growth domestic saving to GDP, total private investment to bank deposit and Management efficiency, have created strong relationship with dependent variables, profitability and sustainability of AIRCABS as stated in Table 17. on the other hand Table 18 displayed the independent variables such as discrete market deposit interest incentive, special deposit ratio, AD interest rate, deposit interest incentive rate, EDUR and deposit interest payment capacity have created strong relationship with dependent variable, SD.

5.4.5. Parameter estimates

Tables 19 and 20 showed outcomes of multinomial logistic coefficient (B), standard error, Wald statistics, significant level, odd ratio (Exp (B)) and confidence interval of odd ratio.

The models estimated likelihood occurrence of sustainability and profitability of AIRCABS relative to likelihood of event occurrence no sustainability and profitability of AIRCABS, in Table 19. Similarly in Table 20, the likelihood occurrence of SD mobilization estimated relative to likelihood occurrence of no SD mobilization. So the model predicted the dependent variables using independent variable based on the magnitude of the parameter estimator, coefficient, corresponding with the odd ratio.

As depicted by the Table 19 a one unit increment of each independent variables, ILF together with its control variables such as financial deepening, Per capita income, growth domestic saving to GDP, total private investment to bank deposit and management efficiency, increased the likelihood of predicting sustainability and profitability of AIRCABS by 111.242 times. Similarly, in Table 20 a one unit increment of each independent variables, discrete market deposit interest incentive together with control variables such as deposit interest incentive rate, AD interest rate, special deposit, efficiency of deposit utilization, deposit interest payment capacity, increased the likelihood of predicting SD mobilization by 205.965 times. In Tables 19 and 20, the odd ratios (Ext (B)) associated with each predictor increased and became >1.0, which indicated that the likelihood of dependent variables strongly predicted by the independent variable. As depicted in the Tables 19 and 20, as the coefficient fare away from zero the predictor variable have high influence in predicting the logit which is what is being

Table 14: Model fitting information of SD

Model	Model fitting Criteria			Likelihood ratio tests		
	AIC	BIC	−2 log likelihood	Chi-square	Df	Significant
Intercept Only	28.734	29.778	26.734			
Final	13.411	15.500	9.411	17.323	1	0.000

SD: Stable deposit

Table 15: Goodness-of-Fit

Profitability and sustainability of AIRCABS				SD		
Measures	Chi-square	Df	Significant	Chi-square	Df	Significant
Pearson	15.029	14	0.376	11.675	19	0.899
Deviance	13.018	14	0.525	9.411	19	0.966

SD: Stable deposit

predicted and is the likelihood of the outcome variables. The WALD statistical test (5.228) which is significant at P = 0.022 in Table 19 and WALD statistics test (4.217) which significant at P = 0.04 in Table 20 increased the model fit to the data sufficiently. This assured that the individual predictors significantly contributed for the improvement of the model and the parameter is useful to the model (Bewick et al., 2005; El-Habil, 2012).

The confidence interval (95%), which is the interval where the true effect lied, was very superior level though confidence interval that didn't include the null value (1) was >1 and found significant. This implied that when exposed to risk, likelihood of having sustainability and profitability of AIRCABS in Table 19 and SD in Table 20 more increased than when an event did not exposed to risk. The odd ratio was very superior to 1, which in turn indicated the likelihood of predictors that predicted the dependent variables was very superior. The combination of independent variables selected to predict the dependent variables were efficient. As evidenced by Table 13 up to Table 20 the dependent variables significantly created strong relationship with dependent variables. The models also predicted 87.5% and 90.5% correctly as indicated in Tables 21 and 22. So disregarding abnormally wide confidence interval the independent variables displayed in Tables 19 and 20 efficiently predicted the respective dependent variables.

5.4.6. Classification table

Tables 21 and 22 showed the classification of how well our full model correctly predicted observed outcome of yes/no profitability and sustainability of AIRCABS and yes/no SD in respectively. Therefore, the overall accuracy of the models predicted 87.5% and 90.5% as stated in Tables 21 and 22 respectively.

5.4.7. Comparing by chance accuracy with model accuracy rate

The proportional by chance accuracy rate computed based on the proportion of yes/no profitability and sustainability of AIRCABS and yes/no SD by squaring and summing proportion of each cases such that for profitability and sustainability of AIRCABS $0.438^2 + 0.563^2 = 0.508813$ in Table 23 and for SD $0.333^2 + 0.667^2 = 0.555778$ in Table 24 respectively. The standard set to characterize multinomial logistic regression model as useful is to improve the overall percentage accuracy by more than 25% the proportion by chance accuracy. So according to the proportional by chance accuracy criteria the percentage of by chance accuracy of the model was 63.60% ($1.25 \times 0.508813 = 63.60\%$) for profitability and sustainability of AIRCABS though the model accuracy rate was 87.5% as stated in Table 21. whereas for SD the proportional by chance accuracy calculated as 69.47% ($1.25 \times 0.555778 = 0.6947225$) though the model accuracy rate was 90.5% as stated in Table 22. The model accuracy rate over by chance accuracy implied that the employed multinomial logistic regression model was useful.

The result of multinomial logistic regression to predict profitability and sustainability of AIRCABS using predictors variables such as ILF together with its control variables, financial deepening, Per capita income, growth domestic saving to GDP, total private investment to bank deposit and management efficiency, showed significant. So the alternative hypothesis that stated as ILF has positive effect on sustainability and profitability of AIRCABS accepted by rejecting the null hypothesis that there is no difference between a model with and without independent predicting variables to predict the dependent variables.

Table 16: Pseudo R^2

Profitability and sustainability of AIRCABS		SD
Cox and Snell	0.427	0.562
Nagelkerke	0.572	0.780
McFadden	0.406	0.648

SD: Stable deposit

Table 17: Likelihood ratio tests of profitability and sustainability of AIRCABS

Effect	Model fitting criteria			Likelihood ratio tests		
	AIC of reduced model	BIC of reduced model	−2 log likelihood of reduced model	Chi-square	Df	Significant
Intercept	23.799	24.572	21.799	8.781	1	0.003
Investor loan funding*financial deepening*per capita income*growth domestic saving to GDP*total private investment to bank deposit*management efficiency	23.930	24.703	21.930	8.912	1	0.003

The Chi-square statistic is the difference in −2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0

Table 18: Likelihood ratio rests of stable deposit

Effect	Model fitting criteria			Likelihood ratio tests		
	AIC of reduced model	BIC of reduced model	−2 log likelihood of reduced model	Chi-square	Df	Significant
Intercept	19.890	20.935	17.890	8.479	1	0.004
Special deposit ratio*average deposit interest rate*discrete market deposit interest incentive*deposit interest incentive rate*EDUR*deposit interest payment capacity	28.734	29.778	26.734	17.323	1	0.000

The Chi-square statistic is the difference in −2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0 SD: Stable deposit, EDUR: Efficiency of deposit utilization ratio

Table 19: Parameter estimates of profitability and sustainability of AIRCABS

Profitability and sustainability of AIRCABS[a]		B	Standard error	Wald	Df	Significant	Expenses (B)	95% confidence interval for expenses (B)	
								Lower bound	Upper bound
Roc	Intercept	−5.048	2.274	4.928	1	0.026			
	Investor loan funding*financial deepening*per capita income*growth domestic saving to GDP*total private investment to bank deposit*management efficiency	111.242	48.651	5.228	1	0.022	2.051E+48	7944764.170	5.293E+89

[a]The reference category is: No profitability and sustainability of AIRCABS

Table 20: Parameter estimates of SD

Stable deposit[a]		B	Standard error	Wald	Df	Significant	Expenses (B)	95% confidence interval for expenses (B)	
								Lower bound	Upper bound
SD	Intercept	−5.458	2.629	4.310	1	0.038			
	Discrete market deposit interest incentive*deposit interest incentive rate*average deposit interest rate *special deposit ratio*EDUR*deposit interest payment capacity	205.965	100.297	4.217	1	0.040	2.816E+89	11927.027	6.647E+174

[a]The reference category is: No SD. EDUR: Efficiency of deposit utilization ratio, SD: Stable deposit

Table 21: Classification of profitability and sustainability of AIRCABS

Observed	Predicted		
	Profitability and sustainability of AIRCABS	No profitability and sustainability of AIRCABS	Percent correct
Profitability and sustainability of AIRCABS	6	1	85.7
No profitability and sustainability of AIRCABS	1	8	88.9
Overall percentage	43.8	56.3	87.5

Table 22: Percentage classification of SD

Observed	Predicted		
	No stable deposit	Stable deposit	Percent correct
No SD	13	1	92.9
SD	1	6	85.7
Overall percentage	66.7	33.3	90.5

SD: Stable deposit

Similarly the result of multinomial logistic regression to predict SD using predictor variables such as discrete market deposit interest incentive together with its control variables such as deposit interest incentive rate, AD interest rate, special deposit ratio, EDUR and deposit interest payment capacity showed significant. so the alternative hypothesis that stated as discrete market deposit interest incentive has positive impact on SD mobilization in case of an interest rate commission agent bank finance an entrepreneur which latter shift to agent position when depositor need to be an investor accepted by rejecting the null hypothesis that there is no difference between models with and without independent predicting variables to predict the dependent variables.

5.4.8. Individual perception on ILF and discrete market deposit interest incentive

In quantitative measurement the CV calculated as standard error to its parameter estimator value. So that, the CV of ILF predicting variables calculated as 0.44 at significant level (P = 0.022) whereas the CV for discrete market deposit interest rate incentive calculated as 0.49 at significant level (P = 0.040), where the standard level of significant for this research study is P < 0.05. The CV calculated above helped to assimilate the perception of individuals' survey participants with the real practice depicted based on financial statements.

To investigate the degree of agreement and disagreement the CV calculated for ILF and discrete market deposit interest incentives.

To investigate the degree of agreement and disagreement, the cutoff point for CV to interpret survey instrument of ILF and discrete market deposit interest incentives considered below 0.50 and above this ceiling level data interpreted with caution. Based on survey questionnaires in Table 2, all survey participants strongly agreed with the point of survey questions except survey questions

Table 23: Case processing summary

Measures	n	Marginal percentage
Profitability and sustainability of AIRCABS		
Profitability and sustainability of AIRCABS	7	43.8
No profitability and sustainability of AIRCABS	9	56.3
Valid	16	100.0
Missing	5	
Total	21	
Subpopulation	16[a]	

[a]The dependent variable has only one value observed in 16 (100.0%) subpopulations

Table 24: Case processing summary

Measures	n	Marginal percentage
SD		
No SD	7	33.3
SD	14	66.7
Valid	21	100.0
Missing	0	
Total	21	
Subpopulation	21[a]	

[a]The dependent variable has only one value observed in 21 (100.0%) subpopulations., SD: Stable deposit

ILF-Q3 (CV 0.55) and ILF-Q4 (CV 0.85), which were a little bit far from central tendency.

Generally among all survey respondents 79% of individual participants' perception on ILF survey questionnaires agreed, whereas, 88% of individual participants' perception on discrete market deposit interest incentive questionnaires agreed with majority of point of questions in survey instruments.

In quantitative analysis significant result found that ILF predicted and created strong relationship with sustainability and profitability of AIRCABS. On the other hand discrete market deposit interest incentives predicted and have strong relationship with SD mobilization. The CV calculated based on the quantitative data to show ILF was a true predictor of sustainability and profitability of AIRCABS and discrete market deposit interest rate incentive was a true predictor of SD variables. The CV calculated based on perception of individual survey participant showed almost below the CV calculated in quantitative measurement. These implied that the individual perception to the point of survey question and the result found in quantitative measurement found concurrent. Therefore, alternative hypothesis (H_1 and H_2) accepted.

6. DISCUSSION

The traditional bank's holding customer deposit as its own asset on its balance sheet exposed to toxic asset, contagion and liquidity drought which consequently led the banks to banking crisis. Since traditional banks always lacks SD because of high competition among banks and money circulates out of bank because of customers' fear for government tax, they were highly involved in lending and borrowing among financial institution, which had brought contagion effect that transmitted across boarder of countries. Financial crisis arose from USA in 2007/08 that transmitted throughout the world had affected the economy of least developed countries (Osakwe, 2010). Unless banks transferred their credit and liquidity risk to individual and nonfinancial institution, transferring risks from bank to other financial institution had same effect on the overall industry.

While the borrowers' loan defaulted, it brought a credit risk to the bank, which in turn brought liquidity crunch. The sources of credit risk are the borrowers' internal poor credit management and commodity price shock. The borrower has less education in credit and cash flow management has exposed the bank to credit risk (Al-Shawabkeh and Kanungo, 2017). A bank loan borrower whose price of exporting items failed because of commodity price fluctuation contributed the increment of the bank's nonperforming loans.

However, AIRCABS shifted credit risk and liquidity crunch to investors and entrepreneurs having collected loan interest rate commission from agreed ILF credit price up to the loan was fully settled. While the agent bank administer the entrepreneurs' business, its main target was mitigating credit and liquidity risk of an investors as well as entrepreneurs. So the agent bank gave much support to entrepreneurs in managing their loan up to settlement. This also enables to maintain mutual benefit of investors, entrepreneurs and the agent bank itself.

As discussed in the section 5.2 of the research statistical analysis, credit risk and liquidity crunch has no effect on AIRCABS as evidenced by quantitative and individual survey participant's perception result. This implied that AIRCABS has strong potential to resist the bank against financial crisis and brought a sustainable profit all the time.

The bank business models that vulnerable the bank to credit risk and liquidity crunch during financial crises remained highly disputed since the late 1990's (Blundell-Wignall and Roulet, 2013). The main fact of the existing bank business models problem is that they didn't transfer the bank's credit risk and liquidity crunch to individual investors and entrepreneurs except they compelled the bank to hold customer deposit as their own asset on their balance sheet, which made them retaining credit risk and liquidity crunch.

The main purpose of AIRCABS is to increase the bank's profitability by shifting credit risk and liquidity crunch to individual investors and entrepreneurs. Though the bank commission considered as non-interest income, it did not volatile per se the traditional bank's non-interest income. Saunders et al. (2016) found no evidence that the share of non-interest income associated with lower profitability or with higher systemic risk. Since the agent bank collected interest rate commission up to loan settlement, the model enable the bank to have sustainable profit up to the loan of entrepreneur settled and did not affect by systematic risk. As the bank handle a number of investor loans funding to entrepreneurs, its profitability and sustainability in a market increased.

As have discussed in section 5.3 of the research study statistical analysis investor loan funding has a strong positive effect on

profitability and sustainability of AIRCABS. The result found in quantitative concurred with the individual survey participants' perception result. Among the factors predicted the agent bank profitability and sustainability, which support to increase ILF, were financial deepening, Per capita income, Growth domestic saving, and private investment and Management efficiency.

Till the depositor move to investor position the bank used the fund for investment but latter shift to agent position while the depositors requested the bank to shift to investor position to get proportionate credit price in terms of discrete deposit interest rate from the investment where the bank has already invested the customer deposit. Since the bank applied discrete deposit interest rate on the customer deposit per the increment of the deposit volume, the bank enable to mobilize SD through the deposit period as well as the loan period while the depositor stayed as investor rather than money depositor. Since an interest rate commission agent bank created liquidity by providing investment solution to investors, depositors and entrepreneurs, it contributes to the growth of the country GDP. This notion concurred with Berger and Sedunov, (2017) whose research result found that bank liquidity creation was statistically and economically significantly positively related with the real economic output (GDP). So applying discrete market deposit interest rate incentive enables the bank to mobilize more SD.

As discussed in section 3.3 in the statistical research analysis result, applying discrete market deposit interest incentive has a strong positive relationship with SD mobilization in the bank. Since money depositors who latter move to investor position to get proportionate credit price per volume of fund already invested by the bank in alternative investment, the depositor's money stayed in the bank as a stable fund till the loan has fully settled.

Generally AIRCABS maximizes the bank's profitability sustainability and SD mobilization by shifting credit risk and liquidity crunch to investors and entrepreneurs.

7. RECOMMENDATION

To implement AIRCABS, the agent bank should equipped with cutting aged risk predicting staff, sufficient capital structure and capital employed. It should also be efficient and effective in service providing to entrepreneur and investor to maintain mutual benefit the parties involved in the contract. Since the agent bank did not pay interest expense on the fund disbursed to an entrepreneur, the agent bank should measure periodically the management efficiency against the interest rate commission collected in the period to mitigate the cost related with loan administration.

While the agent bank resale loan to the new entrant investor the reselling value of the loan should be reasonable according to the market but minimally equivalent to the remained debt amount with a onetime fee to cover administration expense. All collateral and investment project should be registered at government organ in name of the agent bank to administer the loan up to loan settlement. Should entrepreneurs fail to continue repaying the loan the agent bank recruited ahead new entrant entrepreneurs to handle the business by repaying the required amount up to loan settlement without ownership transfer.

While investors and entrepreneurs presented at the agent bank for loan transaction, the agent bank should calculate reasonable credit price on the funds disbursed to entrepreneur based on the market, the central bank policy and the agreed price between investors and entrepreneurs. The agent bank should also refine the true source of the money to avoid money laundry trade financing.

Therefore, it is recommended to implement an interest rate commission agent banking system to avoid banking crisis and enhance the bank profitability and sustainability. Since the model work with other model, its enhance using others bank model by shifting risk while the banking business reached at a buffer stage.

8. CONCLUSION

In conventional banking activities banks either retain or transfer credit and liquidity risk to other financial institutions which latter have the same impact on the overall industry. Since bank sell customer deposit having considered as its own asset on its balance sheet, in most instance banks exposed to toxic asset, non-performing asset or contagion and short of liquidity problems. Once the bank exposed to credit risk they are indirectly affected by hidden financial cost, which the bank was paying interest to depositors on uncollectible loan already disbursed from depositors' account.

The agent bank stood on three pillars such as profitability, sustainability and risk transfer.

Empowering money depositor to exercise their full right for the use of their money to get reasonable credit price rather offering unreasonable deposit interest rate that forced them to join into informal market helped to maintain sustainability and profitability of AIRCABS. This helped the agent bank to transfer credit risk and liquidity crunch to investors and entrepreneurs through lending strategies 360°, 180° and 90° lending strategies, (Tessema and Kruger, 2015; 2016).

The individual survey participants' perception tested using statistical tools such as cronbanch alpha, kuder-Richardson, descriptive statistics, factor analysis, CV and significant result found. The individual survey participants' perception supported the empirical analysis result, which based on financial statement of all commercial banks in Ethiopia. The research hypothesis also tested based on financial data of banking industry in Ethiopia using statistical tools canonical correlation and multinomial logistic regression and the a positive significant result found.

Since deposit run, credit crunch, liquidity risk, non-performing asset and credit risk had no relationship with non-interest income, bank efficiency, ROA, ROE and CA, this proven that credit risk and liquidity crunch had no effect on AIRCABS. So the model helped banks resisting financial crisis by shifting their activities into AIRCABS when bank forecasted whether they would met liquidity and credit crisis.

The main activity of traditional banking was maximizing the net interest margin, which is the proceeds from buying and selling of fund, having borne credit risk and liquidity crunch. However, the main target of AIRCABS is that maximizing agreed interest rate commission from ILF administration and project selection fee for investors. Since AIRCABS did not hold customer fund as an asset on its balance sheet, no financial expense thinkable. So AIRCABS enables the agent bank to collect loan interest rate commission and fee by transferring liquidity and credit risk to investors and entrepreneurs. To investigate this fact the relationship between financial deepening, Per capita income, growth domestic saving to GDP, total private investment to bank deposit, management efficiency and profitability and sustainability of AIRCABS tested and positive strong relationship found. This indicated that as the agent bank became efficient and effective ILF increased and thereby sustainability and profitability of AIRCABS increased. As the result investment on innovative entrepreneurs' project increases, this in turn increased import substitution products and the country's GDP in general.

As the competition among banks in service excellence increases the likelihood of deposit stability at the origin depository bank decreases. Money deposit of customers is the lifeblood of the traditional banks to maintain its sustainability and profitability in the market specifically and financial stability in general. In most instances, retail deposit, deposited by major society, is more stable than wholesale deposit, deposit by few society, in connection with the benefit of deposit interest rate. As interest rate increases, the interest of small money depositors' increases and thereby SD established. This fact tested the relationship between special deposit ratio, AD interest rate, deposit interest incentive rate, EDUR, DPIC and SD, and a significant positive result found. This indicated that discrete market deposit interest incentive had a positive impact on SD mobilization in bank.

In general this brought into a conclusion that an interest rate commission agent banking model is viable as well as reliable. This ensured that the model of AIRCABS had internal and external resistance at a buffer stage where market and economic shock exhibited.

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